

Difficulties of succession pipeline in large industrial enterprises of Nizhny Tagil in studies of tendencies of competitiveness of higher technical education

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Abstract. There have been significant changes in the higher education system in Russia recently. The possibility to apply for post-secondary education to several universities according to the results of the Unified State Examination (USE) and the transition to the two-level structure of higher education have significantly changed the landscape of competitiveness not only between individual universities, but also between large cities, which have become centers of mass attraction of applicants and young specialists. The number of students studying federally funded has been decreasing over the years. As a result, regional universities suffer a shortage of applicants, while local industrial enterprises suffer a shortage of young qualified personnel. The described problems are fully demonstrated in the system of higher education and training of young engineering personnel for large industrial enterprises in Nizhny Tagil. The article reviews the results of the study on the motivational field of academic migration of young people from the Nizhny Tagil city, conducted in February-March 2020.

1. Worldwide and Russian trends in academic migration

Educational opportunities in a large academic center are the main reason for youth migration around the world, as reflected in D P Smith, P R  rat, J Sage, 2014 [1] studies. Migration of young people to large cities is a worldwide trend of urbanization H Mainet, J-Ch Edouard, 2017 [2], developed by perceptions of the prestige of living in a large city J Sinkien, S Kromalcas, 2010 [3], higher economic prospects of personal well-being L Wilken, M G Dahlberg, 2017 [4].

Similar motives for the goal-setting of youth migration to large cities are also noted in the studies of Russian authors, where the desire of young people for self-realization T A Oreshkina, A S Odegov, 2017 [5] and achieving success in the life of S B Abramova are considered as the causal factors for migration, 2015 [6]. Based on a review of publications on this topic, it has to be said that up to date there is no unambiguous and systematically used term that defines the essence of ‘academic migration’. In T V Kuprina, S M Minasyan and A M Tsaturyan, 2019 [7] study, academic migration is defined ‘as educational migration, i. e. including academic mobility of students and labor academic mobility of teachers and scientists, highly qualified personnel on the labor market’. Without disputing the proposed wording, it should be noted that for the purposes of this study the main focus will be on that part of academic migration, which is implemented as a move to another city for higher education and further employment in the period after graduation from school or technical school, i. e., after secondary or secondary vocational education.



2. Academic migration as a problem in small towns

The problem of youth outflow from small towns has already been the subject of analysis by a number of Russian researchers. Based on the analysis of Federal State Statistics Service statistical data in the study of I S Kashnitsky, N V Mkrtchyan and O V Leshukov, 2016 [8], it is shown that the age-specific peak of migration falls on the age of 17–19 years after graduation from 11th grade of school, as well as on the age range of 22–23 years, i. e. according to the results of graduation.

According to the data provided by the Department of Education of the Nizhny Tagil Administration, the outflow of school graduates demonstrates a clear upward trend, amounting to 69 % in 2014 and 83 % in 2019. Such impressive statistics is confirmed in other studies as well. Among them, the results of a survey conducted by the Institute of Social Analysis and Forecasting of the Russian Presidential Academy of National Economy and Public Administration can be mentioned, conducted by N V Mkrtchyan, 2017 [9] in four small towns of the middle Urals, where it is noted that 75 % of students are sure that they will live in a larger settlement than their hometown, and only 4 % of graduates, in the cities studied, intend to stay there after the 11th grade.

The trend of outflow of young people from the city is becoming more and more unsettling not only for higher educational institutions, but also a critical problem of formation of a qualified succession pipeline for large industrial enterprises in Nizhny Tagil. During the last 5–7 years, large industrial enterprises have been experiencing a shortage of young engineering personnel. It is not surprising that with such a mass academic migration of 11th grade graduates, a number of engineering areas of higher education at the Nizhny Tagil Technological Institute have difficulties in attracting applicants even for the budget form of education.

Let us ask ourselves a question about causal factors of migration and such a low interest to enroll in engineering departments of Nizhny Tagil Technological Institute. The most superficial reasons in the interviews with graduates are insufficient salaries at local enterprises and low prestige of engineering professions. It is easy to believe that the motivation factors responsible for high rates of migration from the city are sufficiently demonstrated in these words. However, studies by E S Vakulenko, N V Mkrtchyan and K K Furmanov, 2011 [10] prove the negative connection between migration growth/loss of population in municipal districts and salary at local enterprises. This phenomenon functions as a ‘poverty trap’, Y Andrienko and S Guriev 2004 [11]. In S Guriev, 2010 [12] studies it is shown that the rate of migration is higher from those cities where salaries are higher, because the poverty of households is holding back the outflow of population, ‘it’s so bad that we have to go, but there is nothing to go for’. It is amazing, because from this point of view Nizhny Tagil is a prosperous city, generating a huge mass of school graduates, competitive for admission to the capital’s universities and having economic opportunities to move to another city.

3. Who’s packed and ready to go and what kind of education they’re going to go for: forecast of academic migration of youth in Nizhny Tagil

The empirical basis of the study was formed by the data of the questionnaire survey 655 people of 9 and 11th grade students of general education schools, students of Nizhny Tagil Mechanical-Engineering Technical School and students of Nizhny Tagil Technological Institute. The questionnaire details were collected in February-March 2020. According to the results of the study (Table 1) it can be seen that the aspiration of school graduates to get higher education has a pronounced mass character. Immediately after graduation from the school, 74.1 % of respondents plan to get a higher education, and other 17.8 % believe that they will implement these plans in some time. 43.8 % of the SVE study participants plan to act in a completely different way and to get higher education at the end of current education. This rate is even lower among today’s university students – only 9.1 % plan to get a second higher education immediately after graduation from the university.

Let us further consider the wishes of the study participants regarding moving to another city (Table 1). It is possible that now the mood of young people may look different, as the questionnaire survey was carried out before the measures to prevent a coronavirus pandemic.

Table 1. Plans for getting higher education.

Do you plan to continue your education and get a higher education? (second higher education - for university students)	Where are you currently studying?					
	School, lyceum, gymnasium		Technical school or vocational education institution		Institute or university	
	Frequency, persons	% by column	Frequency, persons	% by column	Frequency, persons	% by column
Yes, I do, right after finishing the current education	403	74.1	28	43.8	4	9.1
Yes, I do, but after a while	97	17.8	27	42.2	10	22.7
Probably not, perhaps only in the distant future.	32	5.9	7	10.9	23	52.3
No, I do not plan on it at all	12	2.2	2	3.1	7	15.9
Total by column	544	100.0	64	100.0	44	100.0

Table 2. Migration plans for getting higher education.

Do you plan to leave Nizhny Tagil for higher education or further employment?	Where are you currently studying?					
	School, lyceum, gymnasium		Technical school or vocational education institution		Institute or university	
	Frequency, persons	% by column	Frequency, persons	% by column	Frequency, persons	% by column
No answer	8	1.5	0	0.0	4	9.1
Yes, I do. I plan on leaving the city	476	87.0	46	71.9	21	47.7
No, I do not.	63	11.5	18	28.1	19	43.2
Total by column	547	100.0	64	100.0	44	100.0

For the subgroup of students, a high forecast for the number of those who want to move to another city to obtain higher education is confirmed, this rate is 87 %. It is indicative that technical school students are also planning to move in significant numbers, in total 71.9 % of those surveyed in the subgroup. Almost half of the students plan to leave after graduation, in total 47.7 % representatives of the subgroup.

4. Academic migration motivational field analysis

The ambiguity of perception and interpretation of economic motivations for migration predetermined the approach to designing research instruments for the survey. Another fundamentally important emphasis of academic mobility motivation is mentioned in the study of S B Abramova, N L Antonova, and O I Pimenova, 2019 [13] – this is an idealized character of perceptions about the city as a place for life, structured in two types of expectations ‘1) a ‘comfortable’ city for everyday practices, open to innovation and creativity; 2) an ‘instrumental’ city – a platform for career growth and material well-being, which may be emotionally unattractive, but functionally effective’.

The idealistic nature of expectations and motivation for academic migration, colored with super-positive images of another and super-negative assessment of a real city, is a key prerequisite for the choice of study methodology. To analyze the motivational field of academic migration, a questionnaire, based on F Herzberg’s motivation-hygiene theory, was developed [14], which considers the assessment of motivational factors as idealized expectations in relation to another city, and on the other hand – the assessment of hygienic factors as more realistic impressions of the hometown. Ordinarily speaking, motivation factors can be considered as reasons to run away for pleasure, while hygienic factors are reasons to run away from dissatisfaction.

The questions of the study conducted by the authors to assess the motivational field of academic migration include 9 factors in each of the groups of motivational and hygienic factors. According to the results in Figure 1 and Figure 2, it is shown that the assessment of attractiveness of the move and dissatisfaction is quite high, both altogether within the study and in the subgroup of school students.

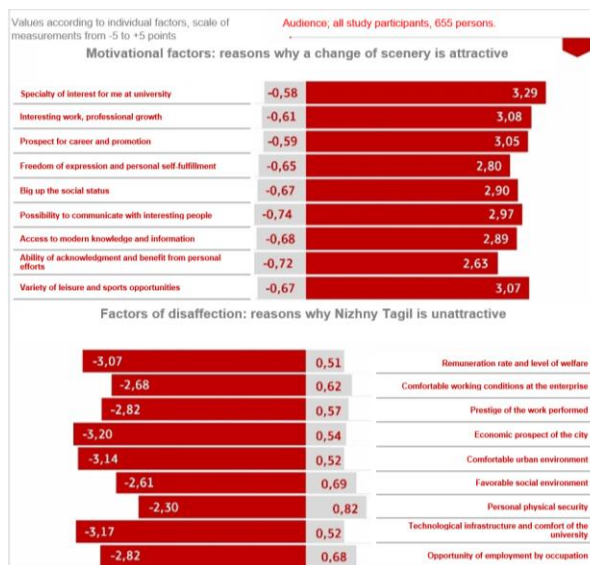


Figure 1. Motivational field structure of academic migration.

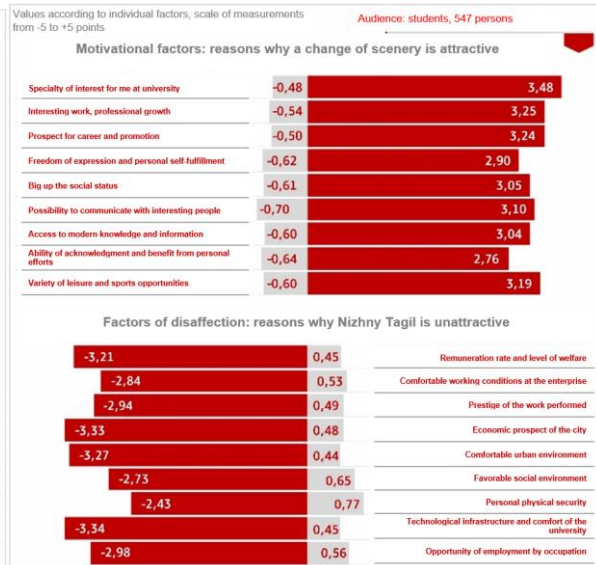


Figure 2. Motivational field structure of academic migration.

Altogether within the study, and also in a subgroup of students, the basic factor of motivation is the presence of a specialty of interest in university of other city, and key factors of dissatisfaction are economic prospect of the city and technological infrastructure, level of comfort of local universities.

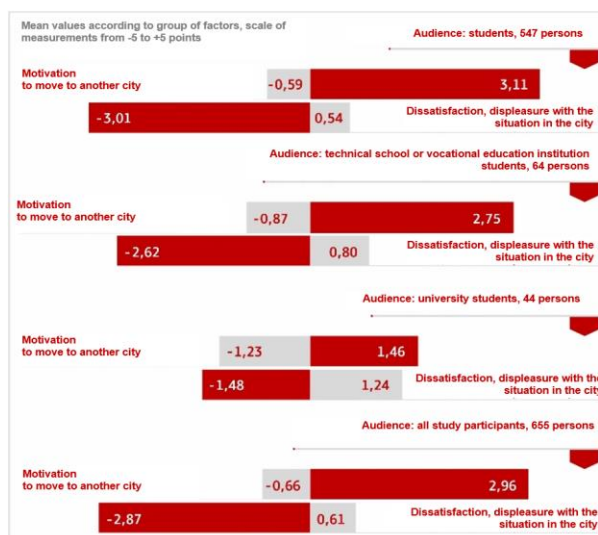


Figure 3. Overall motivation estimates of academic migration in subgroups.

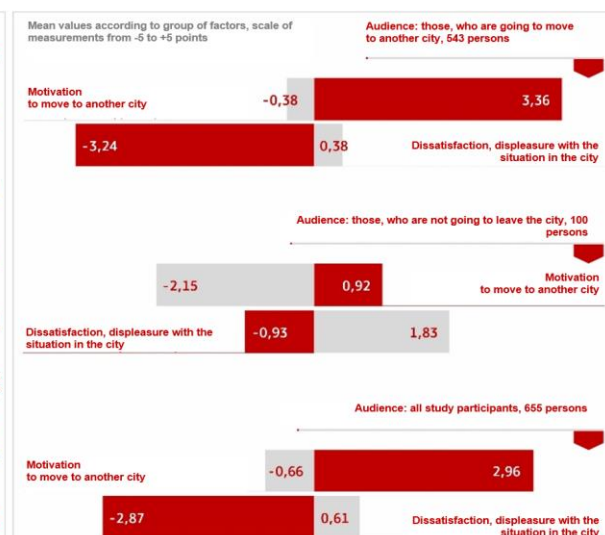


Figure 4. Overall motivation estimates of academic migration in subgroups.

Interesting results are found in the analysis of overall motivation estimates, where the arithmetic mean values are calculated for the groups of motivational and hygienic factors in various subgroups of the study participants. According to the data in Figure 3, university students do not demonstrate a

pronounced motivation to move and dissatisfaction with the internal environment in Nizhny Tagil, but the positive intention to migrate in this subgroup is identical to representatives of other subgroups. However, according to the data in Figure 4, there is a fundamental difference in overall motivation estimates of those who have a positive and negative attitude to the idea of moving to another city. The subgroup of patriots of Nizhny Tagil does not show a high assessment of motivational factors for moving to another city, and there is no dissatisfaction with the internal situation in the city. The motivational field of these subgroups is shown in Figure 5 and Figure 6.

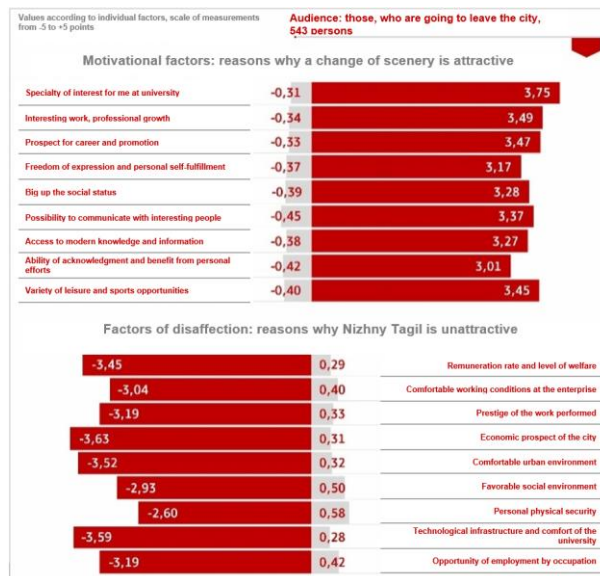


Figure 5. Motivational field structure of study participants, who are favorably disposed toward moving to another city.

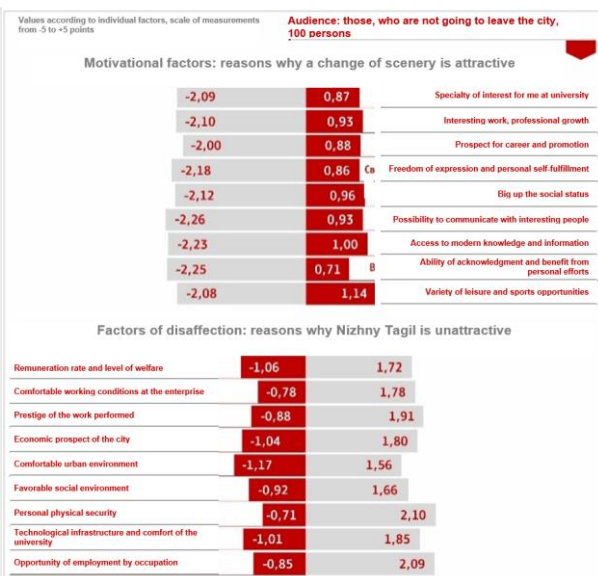


Figure 6. Motivational field structure of study participants, who are negatively predisposed toward moving to another city.

Motivation of the study participants, who have a positive attitude towards moving to another city (Figure 7), singles out the presence of a specialty of interest in the university as a key factor (3.75). The group of the following three factors with practically equal estimates is singled out as a secondary factor: interesting content of work, possibility of professional development (3.49); prospect for career and promotion (3.47); variety of opportunities for leisure, sports and personal self-development (3.45). The determining factor of dissatisfaction in this subgroup of respondents is negative assessment of economic prospects of the city (-3.63). The second position is occupied by the group of the following three factors: technological infrastructure and comfort of the universities (-3.59); comfortable urban environment (-3.52); remuneration rate and personal financial well-being (-3.45).

Motivation of those participants of the study, who negatively evaluated their desire to move (Figure 8), most of all cast doubt on what can be expected in another city: opportunity to work and communicate with interesting people (-2.26); ability of acknowledgment and benefit from personal efforts (-2.25); access to modern knowledge and information (-2.23). As the most motivating perspectives, they see entertainment and leisure opportunities as a factor in the diversity of opportunities for leisure, sports and personal development (1.14). Two factors have been identified by the study participants as the dominant hygienic factors that the city provides: personal physical safety (2.10) and opportunity of employment by occupation (2.09). Three following factors also received high positive estimate among hygienic factors: prestige of the work performed (1.91); technological infrastructure and comfort of the universities (1.85); economic prospect of the city (1.80). And the highest negative estimate (-1.17) representatives of this subgroup gave to the level of comfort of the urban environment.

5. Conclusions

The results of the study confirm that the majority of school graduates associate higher education with entering a university in another city. This indicator is also high among technical school students. The attractiveness of education and employment in a large city is based on a high level of motivation in relation to another city and high dissatisfaction in relation to Nizhny Tagil. Obviously, it is necessary for large industrial enterprises to work purposefully to form a positive and stable picture of the city's economic prospect. For local universities, and in particular, for Nizhniy Tagil Technological Institute, the most important vector of development and competitiveness shall be expansion and modernization of fields of education for students. The key task for the city as a whole is formation of a comfortable, attractive urban environment, provision of a wide range of opportunities for personal self-development and self-realization.

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